

Figure 1

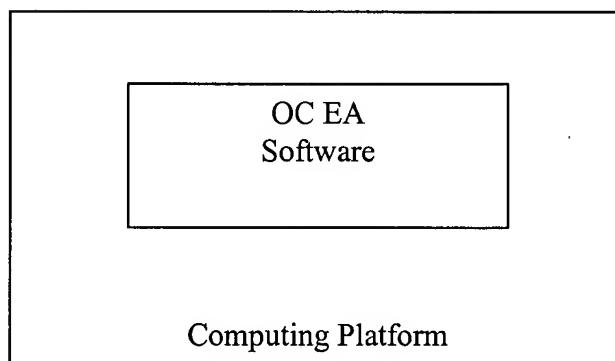


Figure 3

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SUBROUTINE NONLINEAR_FX( INDVAR, FX, JAC, HES )
USE PROBLEM_DATA
USE EB_HANDLING
IMPLICIT NONE
! ARGUMENT LIST VARIABLES
REAL(KIND=8),      DIMENSION(NV), INTENT(IN )::INDVAR
REAL(KIND=8),      DIMENSION(NF), INTENT(OUT)::FX
REAL(KIND=8),      DIMENSION(NF,NF), INTENT(OUT)::JAC
REAL(KIND=8), DIMENSION(NF,NF,NF), INTENT(OUT)::HES
! DEFINE LOCAL EMBEDDED VARIABLES
TYPE(EB), DIMENSION(NV)::EB_VAR
TYPE(EB), DIMENSION(NF)::EB_FCTN
TYPE(EB)::X,Y,Z,U,W
INTEGER::I
! GENERATE EMBEDDED VERSIONS OF INDEPENDENT VARIABLES
CALL EB_INITIALIZE_INDEP_VAR( INDVAR, EB_VAR )
! ASSIGN LOCAL VARIABLES
X=EB_VAR(1);Y=EB_VAR(2);Z=EB_VAR(3);U=EB_VAR(4);W=EB_VAR(5)
! COMPUTE NONLINEAR FUNCTION USING EMBEDDED ALGEBRA
EB_FCTN(1) = EXP(U) + X**2*COS(Z)
EB_FCTN(2) = X*U*(Y*Z)**2
EB_FCTN(3) = X*Y*Z**2
EB_FCTN(4) = Z**3/U
EB_FCTN(5) = Z*SQRT(W)
EB_FCTN(6) = X*U*ASIN(Y/(U*W))
EB_FCTN(7) = Z**((1.0D0/3.0D0)*LOG( SQRT(U) ))
! SORT DATA FOR F(X), JACOBIAN(F), AND HESSIAN(F)
CALL PARTITION_VECTOR_DATA( EB_FCTN, FX, JAC, HES )
RETURN
END SUBROUTINE NONLINEAR_FX

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Figure 2: OCEA Nonlinear Vector Function Routine